

In re application: Hwang *et al.*
Filed: 07/26/2001
Response Dated 5/11/2005

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Serial No.: 09/917,068
Atty. Dkt. No. PAT030
Reply to final Office action of 01/11/2005

LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-10. (previously canceled)

11. (currently amended) A VCSEL comprising:
a substrate having a back surface and a front surface;
a first reflector disposed on the front surface of the substrate;
an active region disposed on the first reflector; and
a second reflector disposed on the active region such that the active region is interposed between the first reflector and the second reflector, wherein the back surface of the substrate comprises periodic row reflection means for causing a specular reflection of light impinging on said period row reflection means from the active region which specular reflection of light is directed away from said active region thereby reducing specular reflection of light into the active region.

12. (previously amended) The VCSEL of claim 11, wherein the periodic row reflection means comprise rows having a triangular cross section.

13. (previously amended) The VCSEL of claim 11, wherein the periodic row reflection means are etched on the back surface using a selective wet etching solution.

14-15. (previously canceled)

16. (previously amended) The VCSEL of claim 11, wherein the periodic row reflection means are etched on the back surface by photoelectrochemical etching.

17. (previously amended) The VCSEL of claim 16, wherein the periodic row reflection means are etched on the back surface by scanning the back surface with a line-focused laser.

18-19 (previously canceled)

20. (currently amended) An array of VCSELs sharing a common substrate, each VCSEL comprising:
a substrate having a back surface and a front surface;
a first reflector disposed on the front surface of the substrate;
an active region disposed on the first reflector; and
a second reflector disposed on the active region such that the active region is interposed between the first reflector and the second reflector, wherein the back surface of the substrate comprises periodic row reflection means for causing a specular reflection of light impinging on said period row reflection means from the active region which specular reflection of light is directed away from said active region thereby reducing specular reflection of light into the active region of each VCSEL.

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21. (previously amended) The array of claim 20, wherein the periodic row reflection means comprise rows having a triangular cross section.

22-36. (previously canceled)

37. (previously added) The VCSEL of claim 12, wherein the triangular cross section of the rows of the periodic row reflection means is such that light directed onto the period row reflection means from the active region is reflected away from the active region.

38. (previously added) The VCSEL of claim 11, wherein the periodic row reflection means comprise rows having a sinusoidal cross section.

39. (canceled)

40. (canceled)

41. (previously added) The VCSEL of claim 21, wherein the triangular cross section of the rows of the periodic row reflection means is such that light directed onto the period row reflection means from the active region is reflected away from the active region.

42. (previously added) The VCSEL of claim 20, wherein the periodic row reflection means comprise rows having a sinusoidal cross section.

43. (previously added) The VCSEL of claim 20, wherein the periodic row reflection means are etched on the back surface using a selective wet etching solution.

44. (previously added) The VCSEL of claim 20, wherein the periodic row reflection means are etched on the back surface by photoelectrochemical etching.

45. (currently amended) The VCSEL of claim ~~45~~ 44, wherein the periodic row reflection means are etched on the back surface by scanning the back surface with a line-focused laser.

46. (canceled)

47. (canceled)

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